GAST
A Unit of IDEX Corporation

ROA/RAA
ROCKING PISTON OIL-LESS PUMPS
Operation & Maintenance Manual

⚠ WARNING

PLEASE READ THIS MANUAL COMPLETELY BEFORE USING THIS PRODUCT. SAVE THIS MANUAL FOR FUTURE REFERENCE AND KEEP IN THE VICINITY OF THE PRODUCT.

Product Use Criteria:

- Pump only clean, dry air.
- Operate at 32ºF - 104ºF (0ºC - 40ºC).
- Protect unit from dirt & moisture.
- Do not pump flammable or explosive gases or use in an atmosphere that contains such gases.
- Protect all surrounding items from exhaust air. This exhaust air can become very hot.
- Corrosive gases and particulate material will damage unit. Water vapor, oil-based contaminants or other liquids must be filtered out.
- Consult your Gast Distributor/Representative before using at high altitudes.
- This pump is oil-less and requires NO lubrication.

Your safety and the safety of others is extremely important.

We have provided many important safety messages in this manual and on your product. Always read and obey all safety messages.

This is the safety alert symbol. This symbol alerts you to hazards that can kill or hurt you and others. The safety alert symbol and the words "DANGER" and "WARNING" will precede all safety messages. These words mean:

DANGER

You will be killed or seriously injured if you don't follow instructions.

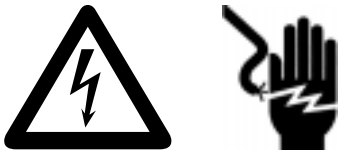
WARNING

You can be killed or seriously injured if you don't follow instructions.

All safety messages will identify the hazard, tell you how to reduce the chance of injury, and tell you what can happen if the safety instructions are not followed.

INSTALLATION

WARNING



Electrical Shock Hazard

Disconnect electrical power at the circuit breaker or fuse box before installing this product.

Install this product where it will not come into contact with water or other liquids.

Install this product where it will be weather protected.

Electrically ground this product.

Failure to follow these instructions can result in death, fire or electrical shock.

Correct installation is your responsibility.
Make sure you have the proper installation conditions and that installation clearances do not block air flow. **Blocking air flow over the product in any way can cause the product to overheat.**

Mounting

This product can be installed in any orientation. Mounting the product to a stable, rigid operating surface and using shock mounts will reduce noise and vibration.

Plumbing

Remove plugs from the IN and OUT ports. Connect with pipe and fittings that are the same size or larger than the product's threaded ports. Be sure to connect the intake and exhaust plumbing to the correct inlet and outlet ports. Ports will not support plumbing.

Accessories

The product's external intake and exhaust muffler will provide adequate filtration in most applications. Check filters periodically and replace when necessary. Consult your Gast Distributor/Representative for additional filter recommendations.

Install relief valves and gauges at inlet or outlet or both, to monitor performance. Check valves may be required to prevent back streaming through the pump.

Motor Control

It is your responsibility to contact a qualified electrician and assure that the electrical installation is adequate and in conformance with all national and local codes and ordinances. The metal capacitor must be grounded.

Determine the correct overload setting required to protect the motor (see motor starter manufacturer's recommendations). Select fuses, motor protective switches or thermal protective switches to provide protection. Fuses act as short circuit protection for the motor, not as protection against overload. Incoming line fuses must be able to withstand the motor's starting current. Motor starters with thermal magnetic overload or circuit breakers protect motor from overload or reduced voltage conditions.

The wiring diagram supplied with the product provides required electrical information. Check that power source is correct to properly operate the dual-voltage motors.

Electrical Connection

WARNING

Electrical Shock Hazard

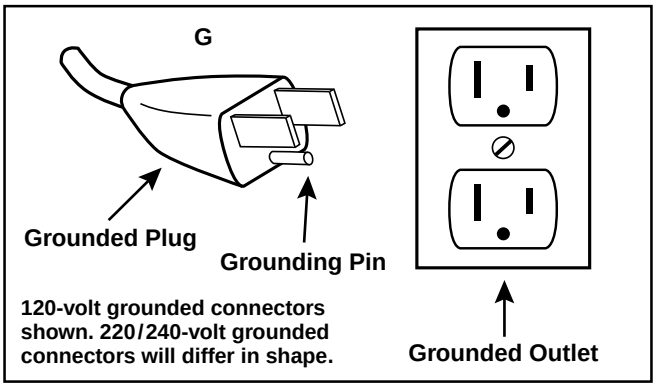
This product must be properly grounded.

Do not modify the plug provided. If it will not fit the outlet, have the proper outlet installed by a qualified electrician.

If repair or replacement of the cord or plug is necessary, do not connect the grounding wire to either flat blade terminal. The wire with insulation that is green or green with yellow stripes is the grounding wire.

Check the condition of the power supply wiring. Do not permanently connect this product to wiring that is not in good condition or is inadequate for the requirements of this product.

Failure to follow these instructions can result in death, fire or electrical shock.



Model with a power supply cord:
This product must be grounded. For either 120-volt or 220/240-volt circuits connect power supply cord grounding plug to a matching grounded outlet. Do not use an adapter. (See above diagram.)

In the event of an electrical short circuit, grounding reduces the risk of electric shock by providing an escape wire for the electric current. This product may be equipped with a power supply cord having a grounding wire with an appropriate grounding plug. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances.

Check with a qualified electrician or serviceman if the grounding instructions are not completely understood, or if you are not sure whether the product is properly grounded. Do not modify the plug provided. If it will not fit the outlet, have the proper outlet installed by a qualified electrician.

Model that is permanently wired:
This product must be connected to a grounded, metallic, permanent wiring system, or an equipment grounding terminal or lead on the product.

Power supply wiring must conform to all required safety codes and be installed by a qualified person. Check that supply voltage agrees with that listed on product.

Extension cords:
Use only a 3-wire extension cord that has a 3-blade grounding plug. Connect extension cord plug to a matching 3-slot receptacle. Do not use an adapter. Make sure your extension cord is in good condition. Check that the gage wire of the extension cord is the correct size wire to carry the current this product will draw.

An undersized cord is a potential fire hazard, and will cause a drop in line voltage resulting in loss of power causing the product to overheat. The following table indicates the correct size cord for length required and the ampere rating listed on the product nameplate. **If in doubt, use the next heavier gage cord. The smaller the gage number, the heavier the wire gage.**

Minimum gage for extension cords

Amps	Volts	Length of cord in feet								
	120V	25	50	100	150	200	250	300	400	500
	240V	50	100	200	300	400	500	600	800	1000
0-2		18	18	18	16	16	14	14	12	12
2-3		18	18	16	14	14	12	12	10	10
3-4		18	18	16	14	12	12	10	10	8
4-5		18	18	14	12	12	10	10	8	8
5-6		18	16	14	12	10	10	8	8	8
6-8		18	16	12	10	10	8	6	6	6
8-10		18	14	12	10	8	8	6	6	4
10-12		16	14	10	8	8	6	6	4	4
12-14		16	12	10	8	6	6	6	4	2
14-16		16	12	10	8	6	6	4	4	2
16-18		14	12	8	8	6	4	4	2	2

OPERATION

WARNING

Injury Hazard

Install proper safety guards as needed.

Keep fingers and objects away from openings and rotating parts.

When provided, motor terminal covers must be in place for safe operation.

Product surfaces become very hot during operation, allow product surfaces to cool before handling.

Air stream from product may contain solid or liquid material that can result in eye or skin damage, wear proper eye protection.

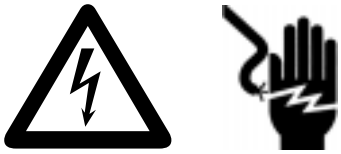
Wear hearing protection. Sound level from motor may exceed 70 dBA.

Failure to follow these instructions can result in burns, eye injury or other serious injury.

It is your responsibility to operate this product at recommended pressures or vacuum duties and room ambient temperatures. Do not start against a vacuum or pressure load.

Start Up
If motor fails to start or slows down significantly under load, shut off and disconnect from power supply. Check that the voltage is correct for motor and that motor is turning in the proper direction. Check the plug, cord and switch for damage. It so equipped, the thermal protection switch has tripped, the motor can restart after cooling.

WARNING



Electrical Shock Hazard

Disconnect electrical power at the circuit breaker or fuse box before installing this product.

Install this product where it will not come into contact with water or other liquids.

Install this product where it will be weather protected.

Electrically ground this product.

Failure to follow these instructions can result in death, fire or electrical shock.

WARNING

Injury Hazard

Product surfaces become very hot during operation, allow product surfaces to cool before handling.

Do not direct air stream at body. Air stream from product may contain solid or liquid material that can result in eye or skin damage, wear proper eye protection.

Clean this product in a well ventilated area.

Failure to follow these instructions can result in burns, eye injury or other serious injury.

It is your responsibility to:

•Regularly inspect and make necessary repairs to product in order to maintain proper operation.
•Make sure that pressure and vacuum are released from product before starting maintenance.

Check intake and exhaust filters after first 500 hours of operation. Clean filters and determinehow frequently filters should be checked during future operation. This one procedure will help to assure the product's performance and service life.

1. Remove filter cover.
2. Remove filters and felt (some filters are held together with a snap fitting). Clean filters by washing in a non-petroleum based solvent or soap and water. After cleaning, dry with compressed air to make sure all moisture is removed before reinstalling filters.
3. Reinstall felt and filters.

Check that all external accessories such as relief valves and gauges are attached to cover and are not damaged before reoperating product.

SHUTDOWN PROCEDURES

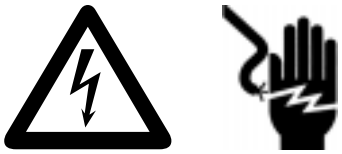
It is your responsibility to follow proper shutdown procedures to prevent product damage. NEVER ADD OIL TO THIS OIL-LESS PUMP.

Proper shutdown procedures must be followed to prevent pump damage. Failure to do so may result in premature pump failure. Gast Manufacturing Rocking Piston Oil-Less Pumps are constructed of ferrous metals or aluminum which are subject to rust and corrosion when pumping condensable vapors such as water. Follow the steps below to assure correct storage and shutdown between operating periods.

1 . Disconnect plumbing.
2. Operate product for at least 5 minutes without plumbing.
3. Run at maximum vacuum for 10 to 15 minutes.
4. Repeat step 2.
5. Disconnect power supply.
6. Plug open ports to prevent dirt or other contaminants from entering product.

SERVICE KIT INSTALLATION

WARNING



Electrical Shock Hazard

Disconnect electrical power supply cord before installing Service Kit.

If product is hard wired into system, disconnect electrical power at the circuit breaker or fuse box before installing Service Kit.

Disconnect air supply and vent all air lines to release pressure or vacuum.

Failure to follow these instructions can result in death, fire or electrical shock.

Gast will NOT guarantee field-rebuilt product performance. For performance guarantee, the product must be returned to a Gast Authorized Service Facility.

1. Disconnect electrical power to pump.

2. Disconnect air supply and vent all air lines to release pressure or vacuum.

3. Remove the head bolts and remove head.

4. Remove the cylinder. Remove shims under the cylinder and remove the two hex head screws on the retainer plate. Remove retainer plate from cup.

5. Place shims under cylinder, **(NOTE: Be sure to replace all the shims as they are matched to the cylinder and rod assembly height dimensions**) install over rod assembly.

6. Position cup and retainer plate on top of the cylinder. With the palm of the hand, gently press retainer and cup down into cylinder.

7. Align holes in retainer and cup with holes in rod, using two screws with locking compound (Loctite grade 222) applied. Reinstall retainer plate and new cup, torque screws to 30 in. lbs.

8. Insert O-ring in groove in cylinder.

9. Install new valve plate, head gasket (**note gasket orientation**), and head on cylinder so ports are in original orientation.

10. Install and snug all head bolts by hand, then in a cross pattern, torque all three bolts using 20 in. lb. increments until you reach 70-80 in. lbs. on each bolt.

Before restarting product, check that all external accessories such as relief valves and gauges are not damaged.

If PUMP still does not produce proper vacuum or pressure, send unit to a Gast Authorized Service Facility for repair.

WARRANTY

Gast finished products, when properly installed and operated under normal conditions of use, are warranted by Gast to be free from defects in material and workmanship for a period of twelve (12) months from the date of purchase from Gast or an authorized Gast Representative or Distributor. In order to obtain performance under this warranty, the buyer must promptly (in no event later than thirty (30) days after discovery of the defect) give written notice of the defect to Gast Manufacturing Incorporated, PO Box 97, Benton Harbor Michigan USA 49023-0097 or an authorized Service Center (unless specifically agreed upon in writing signed by both parties or specified in writing as part of a Gast OEM Quotation). Buyer is responsible for freight charges both to and from Gast in all cases.

This warranty does not apply to electric motors, electrical controls, and gasoline engines not supplied by Gast. Gast's warranties also do not extend to any goods or parts which have been subjected to misuse, lack of maintenance, neglect, damage by accident or transit damage.

THIS EXPRESS WARRANTY EXCLUDES ALL OTHER WARRANTIES OR REPRESENTATIONS EXPRESSED OR IMPLIED BY ANY LITERATURE, DATA, OR PERSON. GAST'S MAXIMUM LIABILITY UNDER THIS EXCLUSIVE REMEDY SHALL NEVER EXCEED THE COST OF THE SUBJECT PRODUCT AND GAST RESERVES THE RIGHT, AT ITS SOLE DISCRETION, TO REFUND THE PURCHASE PRICE IN LIEU OF REPAIR OR REPLACEMENT.

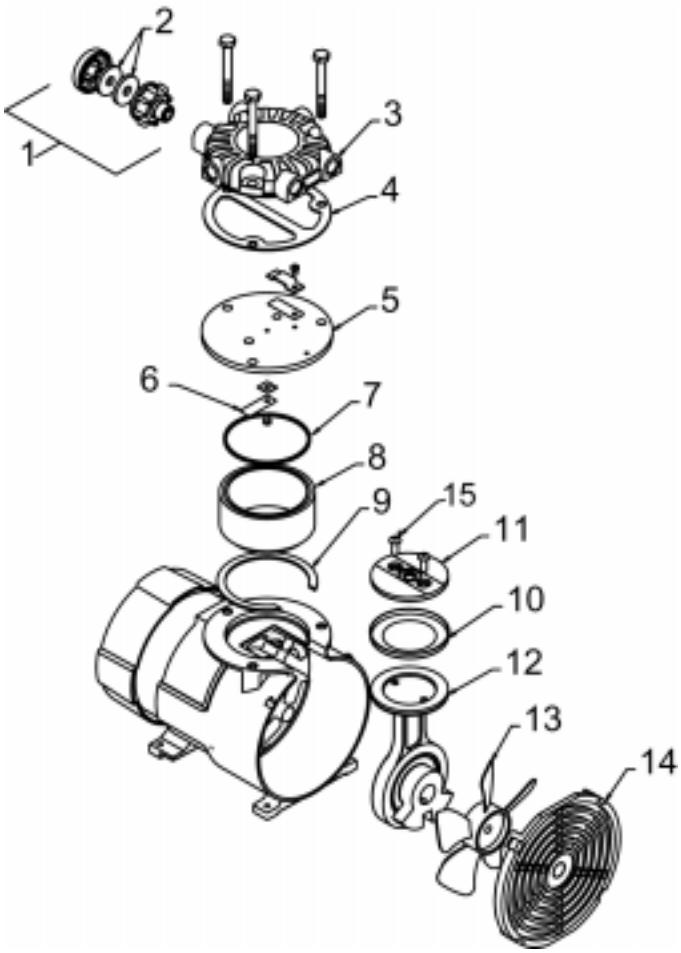
GAST WILL NOT BE RESPONSIBLE OR LIABLE FOR INDIRECT OR CONSEQUENTIAL DAMAGES OF ANY KIND, however arising, including but not limited to those for use of any products, loss of time, inconvenience, lost profit, labor charges, or other incidental or consequential damages with respect to persons, business, or property, whether as a result of breach of warranty, negligence or otherwise. Notwithstanding any other provision of this warranty, BUYER'S REMEDY AGAINST GAST FOR GOODS SUPPLIED OR FOR NON-DELIVERED GOODS OR FAILURE TO FURNISH GOODS, WHETHER OR NOT BASED ON NEGLIGENCE, STRICT LIABILITY OR BREACH OF EXPRESS OR IMPLIED WARRANTY IS LIMITED SOLELY, AT GAST'S OPTION, TO REPLACEMENT OF OR CURE OF SUCH NONCONFORMING OR NON-DELIVERED GOODS OR RETURN OF THE PURCHASE PRICE FOR SUCH GOODS AND IN NO EVENT SHALL EXCEED THE PRICE OR CHARGE FOR SUCH GOODS. GAST EXPRESSLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE WITH RESPECT TO THE GOODS SOLD. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTIONS SET FORTH IN THIS WARRANTY, notwithstanding any knowledge of Gast regarding the use or uses intended to be made of goods, proposed changes or additions to goods, or any assistance or suggestions that may have been made by Gast personnel.

Unauthorized extensions of warranties by the customer shall remain the customer's responsibility.

CUSTOMER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF GAST PRODUCTS FOR CUSTOMER'S USE OR RESALE, OR FOR INCORPORATING THEM INTO OBJECTS OR APPLICATIONS WHICH CUSTOMER DESIGNS, ASSEMBLES, CONSTRUCTS OR MANUFACTURES.

This warranty can be modified only by authorized Gast personnel by signing a specific, written description of any modifications.

ROA PARTS ORDERING INFORMATION

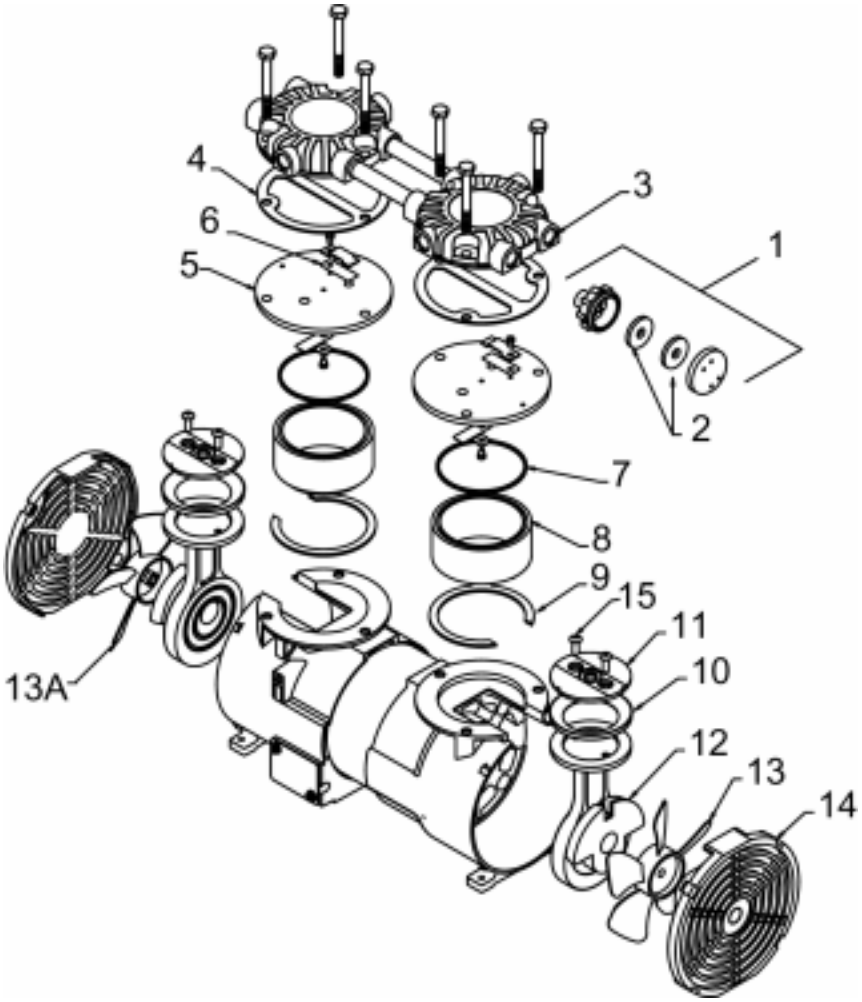


Ref No.	Description	Qty.	ROA-P201-AA	ROA-P201-JH ROA-P201-BN	ROA-P112-EB	ROA-V210-AA	ROA-V210-BN
1	Filter Muffler Assy	1	AH190	AH190	B300A	AH190	AH190
2	Filter Element	2	AA929	AA929	(1)B344A	AA929	AA929
3	Head	1	AJ347	AJ347	AJ347	AJ347	AJ347
*4	Head Gasket	1	AJ404A	AJ404A	AJ404A	AJ404A	AJ404A
*5	Valve Plate Assy Included valves	1	AJ343A	AJ343A	AJ343A	AJ343A	AJ343A
6	Valves	2	AF817	AF817	AF817	AF817	AF817
*7	O-Ring Cylinder	1	AH179	AH179	AH179	AH179	AH179
8	Cylinder	1	AJ342	AJ342	AJ342	AJ342	AJ342
9	Shims	As Req.	AJ345	AJ345	AJ345	AJ345	AJ345
*10	Cup	1	AH175	AH175	AH175	AH175	AH175
11	Retainer Plate	1	AT715A	AT715A	AT715B	AT715B	AT715A
12	Connecting Rod Assy	1	AT846	AT846A	AT846N	AT846G	AT846G
13	Fan	1	AF533	AF533	AF533	AF533	AF533
14	Grille	1	AH185	AH185	AH185	AH185	AH185
15	Screw	2	AT283	AT283	AT283	AT283	AT283
	Service Kit	1	K757	K757	K757	K757	K757

* Denotes parts included in the service kit

Parts listed are for stock model units. For specific OEM models, consult the factory. When ordering parts, please provide full model and serial model.

RAA PARTS ORDERING INFORMATION



Ref No.	Description	Qty.	RAA-V210-EB RAA-V210-ED	RAA-V211-EB	RAA-P203-GD RAA-P203-EB
1	Filter Muffler Assy	1	AH190	AH190	AH190
2	Filter Element	2	AA929	AA929	AA929
3	Head	2	AJ343J	AJ347R(1) AJ347S (1)	AJ347J
*4	Head Gasket	2	AJ404A	AJ404A	AJ404A
*5	Valve Plate Assy Included valves	1	AJ343A AJ343A	AJ343 (2)	AJ343 AJ343A
6	Valves	1	AF817	AF817	AH817
*7	O-Ring Cylinder	2	AH179	AH179	AH179
8	Cylinder	2	AJ342	AJ342	AJ342
9	Shims	As Req.	AJ345	AJ345	AJ345
*10	Cup	2	AH175	AH175	AH175
11	Retainer Plate	2	AT715B	AT715B	AT715A
12	Connecting Rod Assy	2	AT846H	AT846J	AT846L
13	Fan	1	AF533	AF533	AF533
13A	Fan	1	AF533A	AF533A	AF533A
14	Grille	2	AH185	AH185	AH185
15	Screw	4	AT283	AT283	AT283
	Service Kit	1	K756 & K757	K756	K756 & K757

* Denotes parts included in the service kit

Parts listed ae for stock model units. For specific OEM models, consult the factory. When ordering pats, please provide full model and serial model.

TROUBLE SHOOTING GUIDE

REASON	LOW PRESSURE	HIGH PRESSURE	LOW VACUUM	EXCESSIVE NOISE	OVER HEATING	WON'T START
Dirty Filter	x				x	
Dirty Muffler			x		x	x
Dirty Valves	x		x			
Damaged Valves	x		x	x		x
Worn/Damaged Cup	x		x			
Improper Cylinder Shimming	x	x	x	x	x	x
Leaky Hose	x		x			
Leaky Check Valve						x
Plugged Vac. or Press. Line	x	x	x		x	x
Low Voltage	x		x		x	x
Leaky Relief Valve	x		x			

We have Gast Authorized Repair Facilities throughout the world. For the most up-to-date listing, contact one of our sales offices below:

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